ISSN 0704-3716

Canadian Translation of Fisheries and Aquatic Sciences

No. 5292

The production of scallop seed in 1970

Y. Hayakawa, S. Nishiyama, T. Hondo

Original title: Showa 45 nen Hotategai no Shubyo Seisan

In: Aomori-ken Suisan Zoshoku Kenkyusho Jigyo Gaiyo 3: 5-7, 1974

Original language: Japanese

Available from:
Canada Institute for Scientific and Technical Information
National Research Council
Ottawa, Ontario, Canada K1A 0S2

1987

6 typescript pages

90-02123/

DEPARTMENT OF THE SECRETARY OF STATE
TRANSLATION BUREAU

MULTILINGUAL SERVICES DIVISION

CANADA

SECRÉTARIAT D'ÉTAT
BUREAU DES TRADUCTIONS

DIVISION DES SERVICES MULTILINGUES

TRANSLATED FROM – TRADUCTION DE	INTO – EN
Japanese	English

AUTHOR – AUTEUR

Y. Hayakawa, K. Nishiyama, T. Hondo

TITLE IN ENGLISH – TITRE ANGLAIS

The production of scallop seed in 1970

TITLE IN FOREIGN LANGUAGE (TRANSLITERATE FOREIGN CHARACTERS)
TITRE EN LANGUE ÉTRANGÈRE (TRANSCRIRE EN CARACTÈRES ROMAINS)

Showa 45 nen Hotategai no Shubyo Seisan

REFERENCE IN FOREIGN LANGUAGE (NAME OF BOOK OR PUBLICATION) IN FULL. TRANSLITERATE FOREIGN CHARACTERS.
RÉFÉRENCE EN LANGUE ÉTRANGÈRE (NOM DU LIVRE OU PUBLICATION), AU COMPLET, TRANSCRIRE EN CARACTÈRES ROMAINS.

Aomori-ken Suisan Zoshoku Kenkyusho Jigyo Gaiyo

REFERENCE IN ENGLISH – RÉFÉRENCE EN ANGLAIS

Bulletin of the Aquaculture Institute of the Aomori Prefecture

PUBLISHER – ÉDITEUR	DATE OF PUBLICATION / DATE DE PUBLICATION			PAGE NUMBERS IN ORIGINAL / NUMÉROS DES PAGES DANS L'ORIGINAL
–	YEAR / ANNÉE	VOLUME	ISSUE NO. / NUMÉRO	5–7
PLACE OF PUBLICATION / LIEU DE PUBLICATION				NUMBER OF TYPED PAGES / NOMBRE DE PAGES DACTYLOGRAPHIÉES
–	1974	3		6

REQUESTING DEPARTMENT / MINISTÈRE-CLIENT: Fisheries & Oceans

TRANSLATION BUREAU NO. / NOTRE DOSSIER N°: 244882

BRANCH OR DIVISION / DIRECTION OU DIVISION: Resource Services/Shellfish

TRANSLATOR (INITIALS) / TRADUCTEUR (INITIALES): PS

PERSON REQUESTING / DEMANDÉ PAR: F. Bernard

SEP 29 1981

YOUR NUMBER / VOTRE DOSSIER N°: –

DATE OF REQUEST / DATE DE LA DEMANDE: September 21, 1981

BOB-200-10-6 (REV. 2/68)
7880-21-029-5333

Secretary of State / Secrétariat d'État

MULTILINGUAL SERVICES DIVISION – DIVISION DES SERVICES MULTILINGUES

TRANSLATION BUREAU / BUREAU DES TRADUCTIONS

Client's No.–N° du client	Department – Ministère	Division/Branch – Division/Direction	City – Ville
	Fisheries & Oceans	Resource Services/ Shellfish	
Bureau No.–N° du bureau	Language – Langue	Translator (Initials) – Traducteur (initiales)	
244882	Japanese	PS	SEP 29 1981

The production of scallop seed in 1970

by

Y. Hayakawa, K. Nishiyama, T. Hondo

Foreword

In 1969, we were able to gather about 210,000 juvenile shells with an average length of 1.3 mm. We made some findings and became aware of some problems regarding mass collection of seed. On the basis of our findings, we attempted a production of seed aimed at obtaining still larger quantities, but encountered a variety of new problems concerning the rearing of the eggs collected. Furthermore, because of mechanical trouble, water control was hampered and we did not obtain what we had hoped for. Our activities are reported as follows. However, we first want to extend our warmest thanks to the personnel of the fishermen's cooperative in Kawauchi, Shimokita Township*.

Materials and Methods

1) Mother shells

We used about 700 mother shells 3-6 years of age obtained through 14 gatherings in the Kawauchi area from November 29, 1969 through May 19, 1970. We used 600 indivdiuals for growth measurement and spawning induction, and 100 individuals for spawning control.

---

* Translator's Note: Aomori Prefecture.

2) Spawning induction and spawning control

To induce spawning, we placed 8-12 mother shells in toro boxes* through which we ran 5-6°C seawater changed later to warmed seawater. The temperature of the water was raised slowly so as to reach 14-15°C within 1.0 ~ 1.5 hours inside the toro boxes.

To control spawning, we placed about 100 mother shells in a 1 t concrete tank through which we ran fresh seawater cooled to 5-6°C. For this control, we used individuals gathered on March 14 and carried out the control until May 19.

3) Rearing of the swimming larvae and of the juvenile shells at the early attachment period

To rear the swimming larvae the water temperature was brought to 15 ± 1°C. We used two methods. One was to change 1/3 of the water every day and the other to change the whole water every 3-5 days. The larvae were fed Monochlysis lutheri (hereafter Mc.), Chaetoceros calcitrans (hereafter Ch.) and Green Water (hereafter G.W.). We adopted 6 feeding formulae: Mc. only, Ch. only, G.W. only, Mc. and Ch., Mc. and G.W., Ch. and G.W. When converting to Mc., the larvae at the stages from early type D to 150μ were fed 2,000 cells per individual per day. Those in the 150-180μ range received 3,000 cells per individual per day. Thereafter, until they attached themselves, they received 6,000 cells per individual per day. The attached individuals received 3-4 times as much. The cell number conversion ratio for

---

* Translator's Note: Boxes used in Japan to hold fish; about 2' x 2½' x 5".

Mc., Ch., G.W. was 1 : 2 : 10. With combined feed, the cell numbers ratio was adjusted to 1 : 1. We used mainly netoron* nets as attachment surface.

4) Rearing of the juvenile shells at sea p. 6

When the shell of the attached juveniles had grown 1 mm long, they were gathered and the successive contents of the collectors were placed in large size onion bags which were suspended in the sea with a line for rearing.

Results

1) Growth and spawning induction results

These are shown in Table 1. The average growth (weight of reproductive organs/weight of soft parts x 100 (%)) was lower than during the previous year. The releases of eggs and of sperm in response to temperature stimulation were practically the same as last year's.

2) Spawning control

While controlling about 100 mother shells collected on March 14, we reared them, feeding them daily. As we noted spawning by some individuals at the end of March, we carried out subsequent control by lowering the temperature to 4-5°C. The results are shown in Tables 1 and 2. We were somewhat successful in controlling.

---

* Translator's Note: As transliterated; a synthetic fiber.

3) Rearing of the swimming larvae and of the juveniles having a shell of 3 cm or less

The ascent of the larvae is most active about 20 hours following fecundation. After about 50 hours, most larvae reach the early D-type stage. At about 10 days following fecundation, the tip of the shell expands (shell length 150-180 μ), after about 20 days ocelli appear (shell length 230-250 μ), and 2-3 days later most individuals are attached to the seed collector (shell length 240-290μ). About 10 days after attaching themselves, the shells reach roughly 1 mm and the juveniles are placed in the sea. In December 1970, we had about 100,000 juvenile shells of 2-5 cm. The progress can be seen in Table 2.

During the rearing of the larvae at the early D-type stage, we found that the growth was superior with the method in which the whole water is replaced every 3-5 days as compared to the method in which 1/3 of the water is changed daily, but the yield was better with the latter. Feed consisting of G.W. alone is unsuited as it produces very poor growth and yield. p. 7

Discussion

This year, we had much trouble. The seawater used for rearing was extremely dirty, the larvae gathered at the bottom of the tank and the protozoa used as feed were in bad condition so that we were unable to carry out the various rearing tests. Now we know several points where improvement is called for. Several questions need further study. We must develop a technique enabling to obtain normal early stage D-type larvae. For keeping the rearing water in good condition, we must try

to control the multiplication of the protozoa, and we must obtain a water quality control taking into consideration the method and time of water changing, and the time for washing the eggs after insemination. We have to reexamine the best kinds and quantities of feed, discover the reason for the attrition subsequent to arrival in the sea and endeavor to always produce healthy seed.

Table 1 Growth and Spawning Induction

a. 採捕月日	b. 成熟調査及び誘発月日	誘発率(%) c.		生殖巣重量/軟体部重量 ×100 (%) d	
		♂	♀	♂	♀
1969 11/29	1969 12/2	—	—	11.5	12.5
〃 12/18	〃 12/20	—	—	14.3	15.2
1970 1/2	1970 1/2	—	—	13.0	10.2
〃 1/22	〃 1/22	—	—	17.4	19.0
〃 2/13	〃 2/13	—	—	22.7	22.3
〃 2/23	〃 2/26	94.4	20.8	25.1	26.4
〃 2/26	〃 3/4	71.4	40.0	25.6	25.4
〃 3/6	〃 3/7	76.5	51.6	24.5	23.0
〃 3/13	〃 3/14	91.7	92.3	24.3	18.7
〃 3/24	〃 3/24	90.5	51.9	26.9	27.6
〃 4/6	〃 4/7	61.5	81.0	19.5	22.5
〃 4/11	〃 4/11	46.2	12.5	23.0	19.8
〃 4/23	〃 4/24	27.3	40.0	20.5	17.2
〃 3/14	〃 4/24	65.0	33.3	17.3	16.9
〃 3/14	〃 5/19	43.5	6.3	13.0	11.1

Key:

a date of collection
b date of gonad examination and of induction
c induction rate (%)
d $\frac{\text{weight of gonads}}{\text{weight of soft parts}} \times 100\ (\%)$

Table 2 Rearing Progress

第2表 飼育経過

a. 誘発番号	b. 誘発月日	c. 初期D幼生数	d. 付着数	e. (初期D数/付着数)'	f. 殻長1cm稚貝	g. 45 12現在 (殻長2～5cm)
1	2／26	一万	0万			
2	3／4	170.0	0			
3	3／7	358.4	0			
4	3／14	1277.0	100.0	(7.8%)		
5	3／24	436.0	37.0	(8.5%)		
6	4／6	264.0	100.0	(37.9%)	計 k 約15万	計 k 約 10万
7	4／11 h	385.0	88.0	(22.9%)		
8	4／24 (h)	815.4	80.0	(9.8%)		
9	4／24					
10	5／19 (h)	503.0	96.0	(19.1%)		
j. 計9		4208.8	501.0	(11.9%)	15.0	10.0

Key:

a induction No.
b induction date
c number of larvae at the early-D stage
d number of individuals attached
e $\frac{\text{number of individuals at the early D stage}}{\text{number of individuals attached}}$
f juveniles with 1 cm shells
g Dec. 1970 (shell length 2-5 cm)
h control
i about
j total
k 10,000